

No. 750,207.

PATENTED JAN. 19, 1904.

J. S. LOCKWOOD.
ELECTROMAGNETIC BRAKE.
APPLICATION FILED JUNE 23, 1902

NO MODEL.

2 SHEETS—SHEET 1.

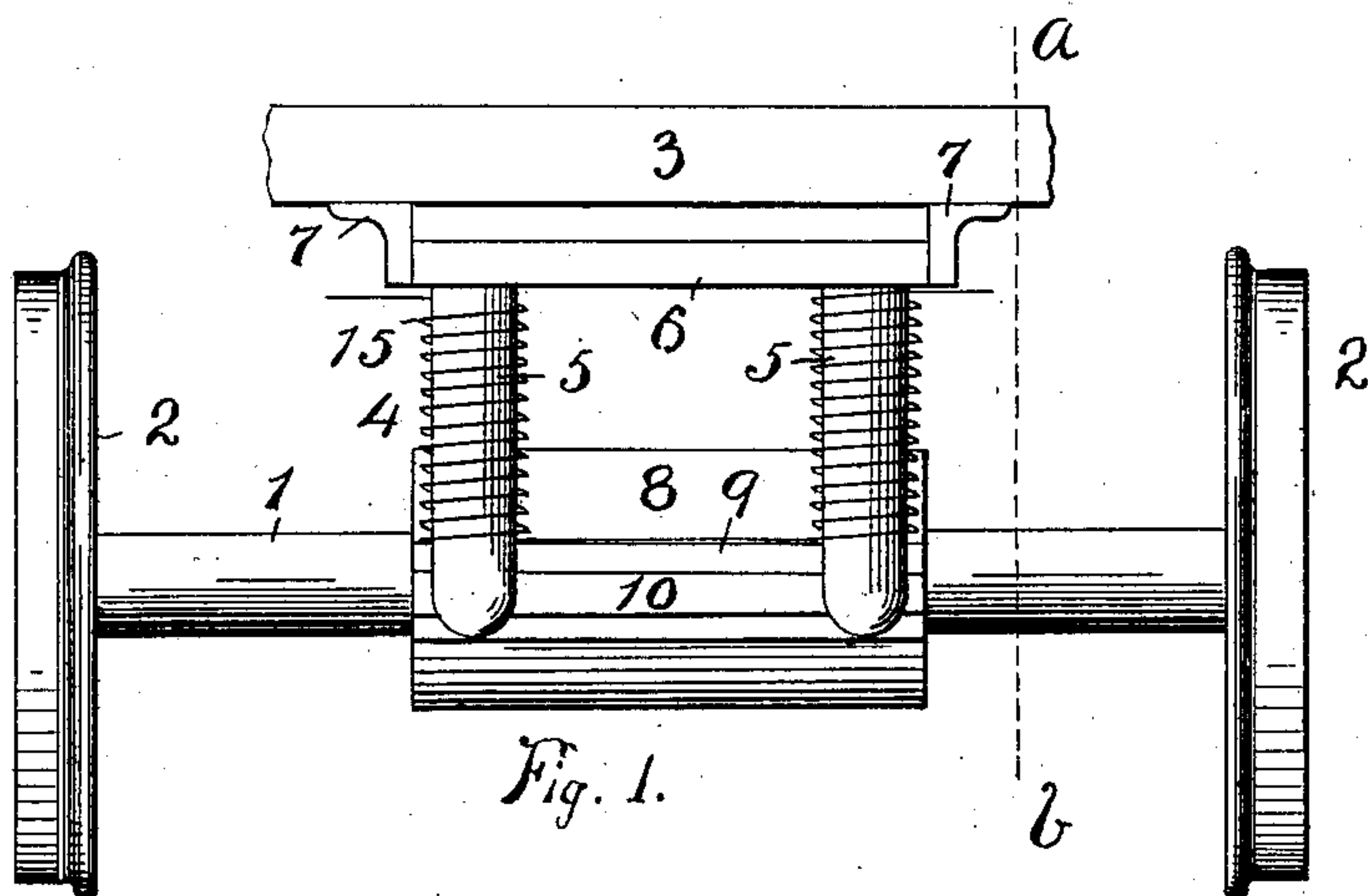


Fig. 1.

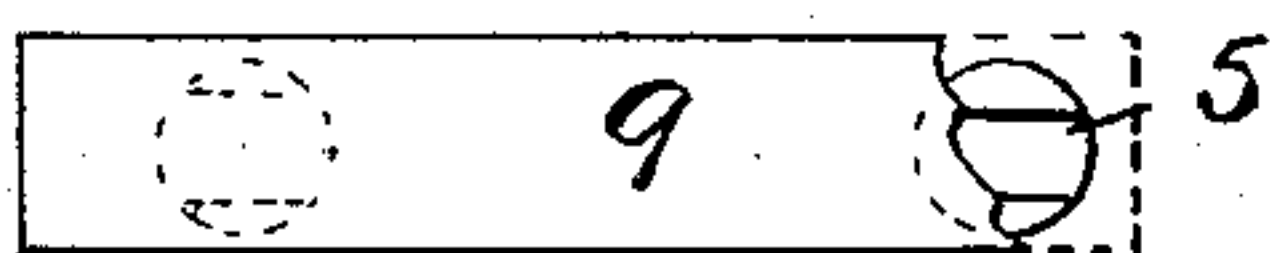


Fig. 2.

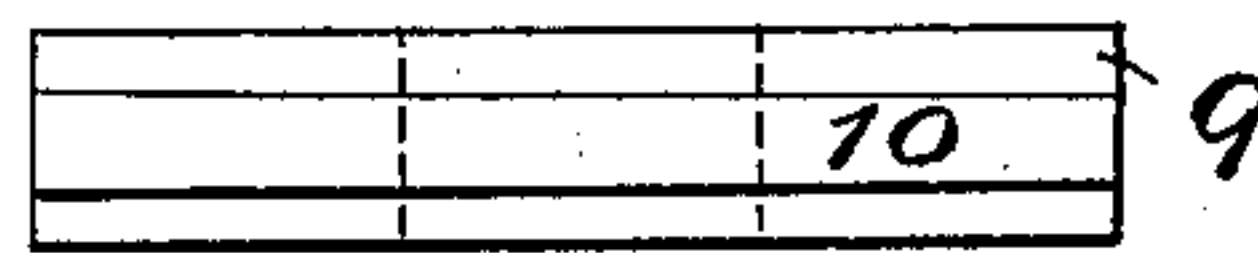


Fig. 3.

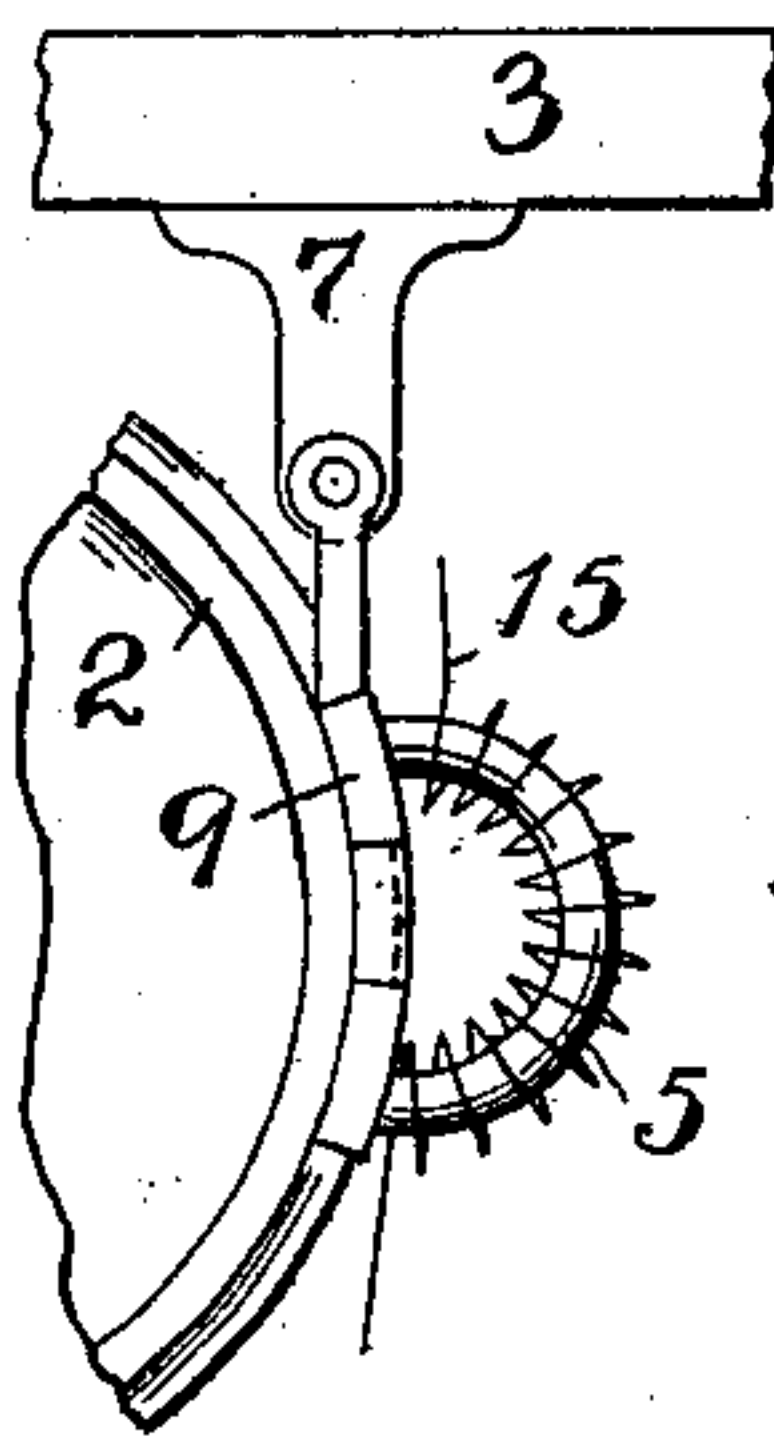


Fig. 7.

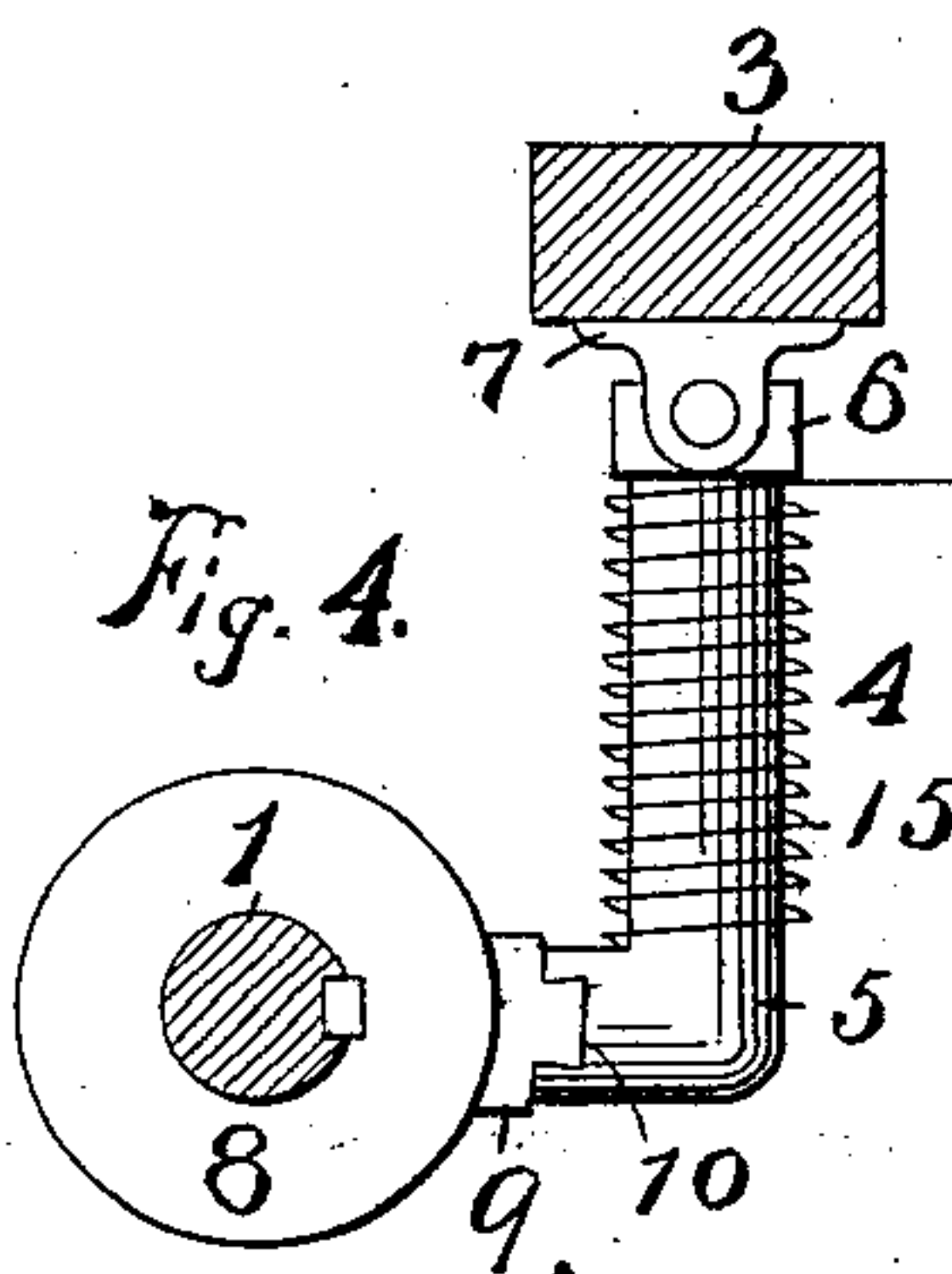


Fig. 4.

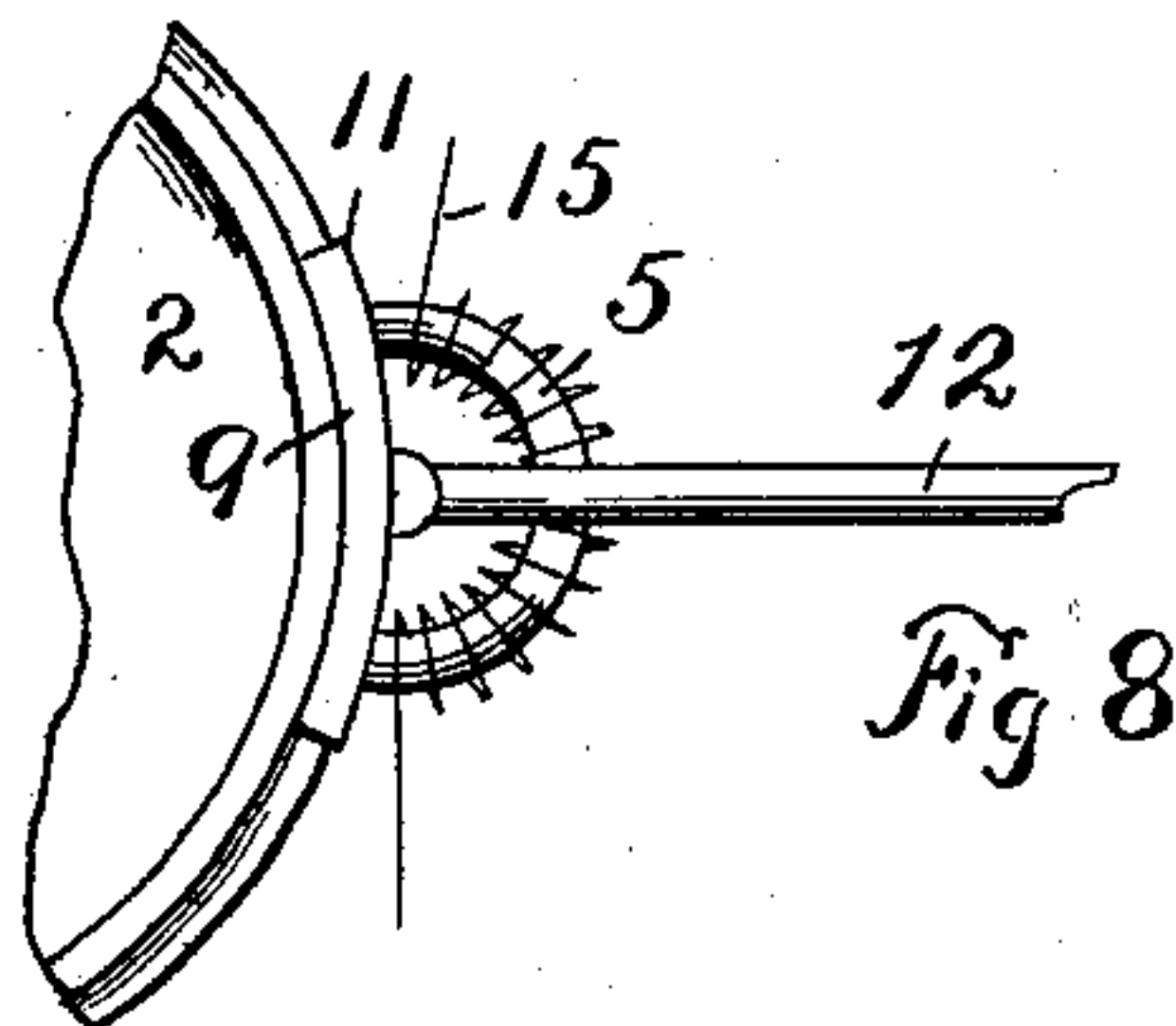


Fig. 8.

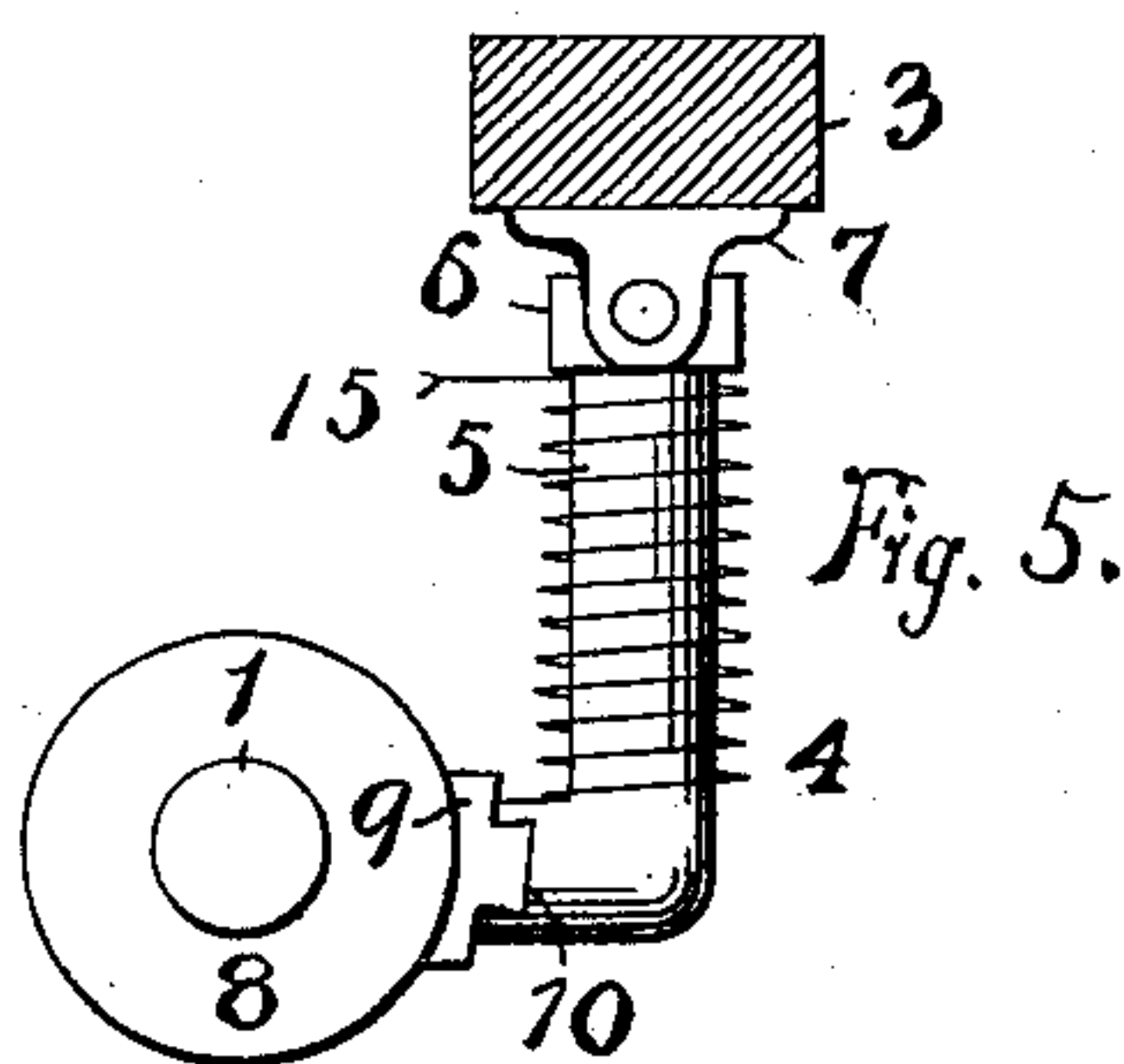


Fig. 5.

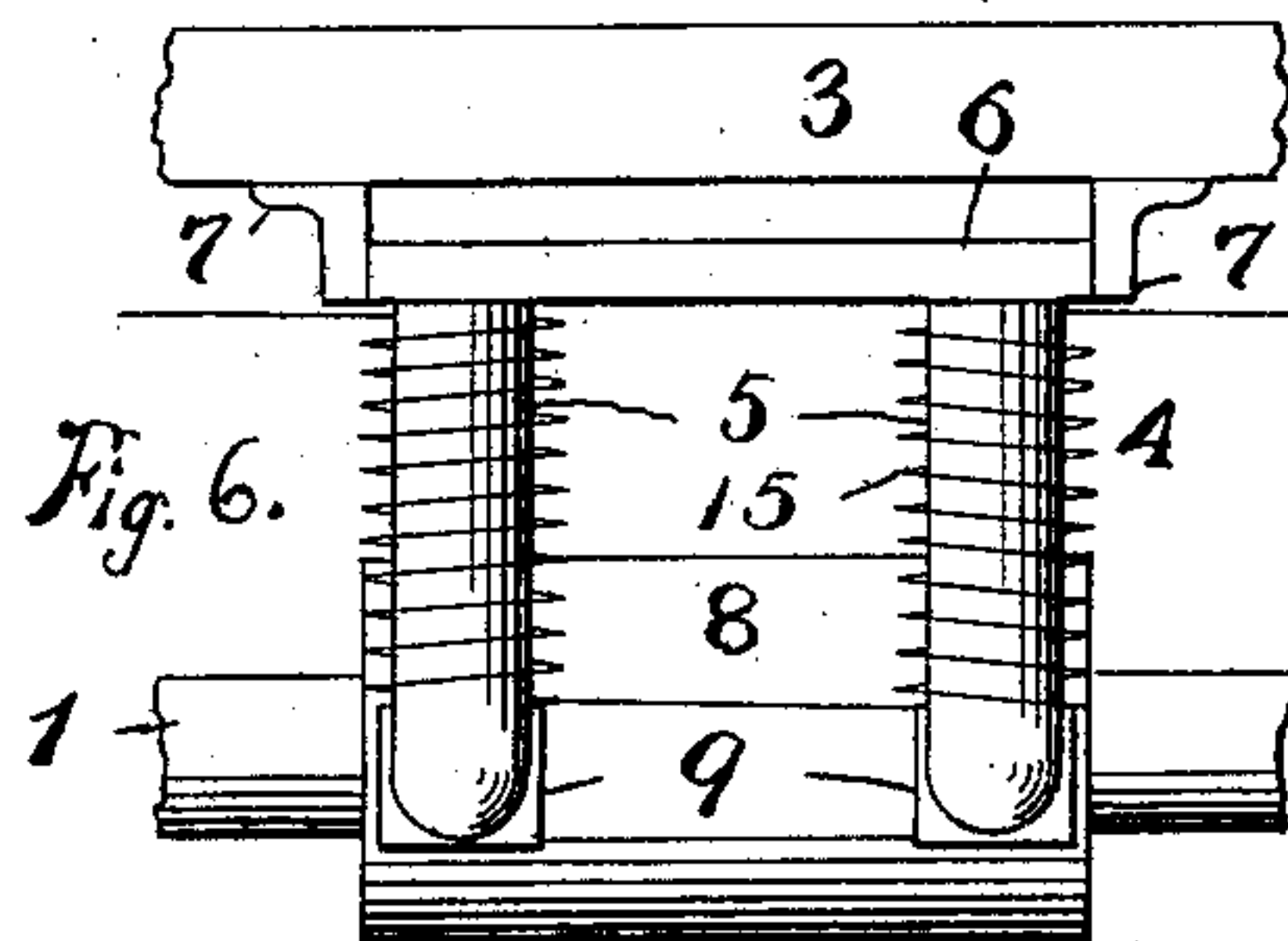


Fig. 6.

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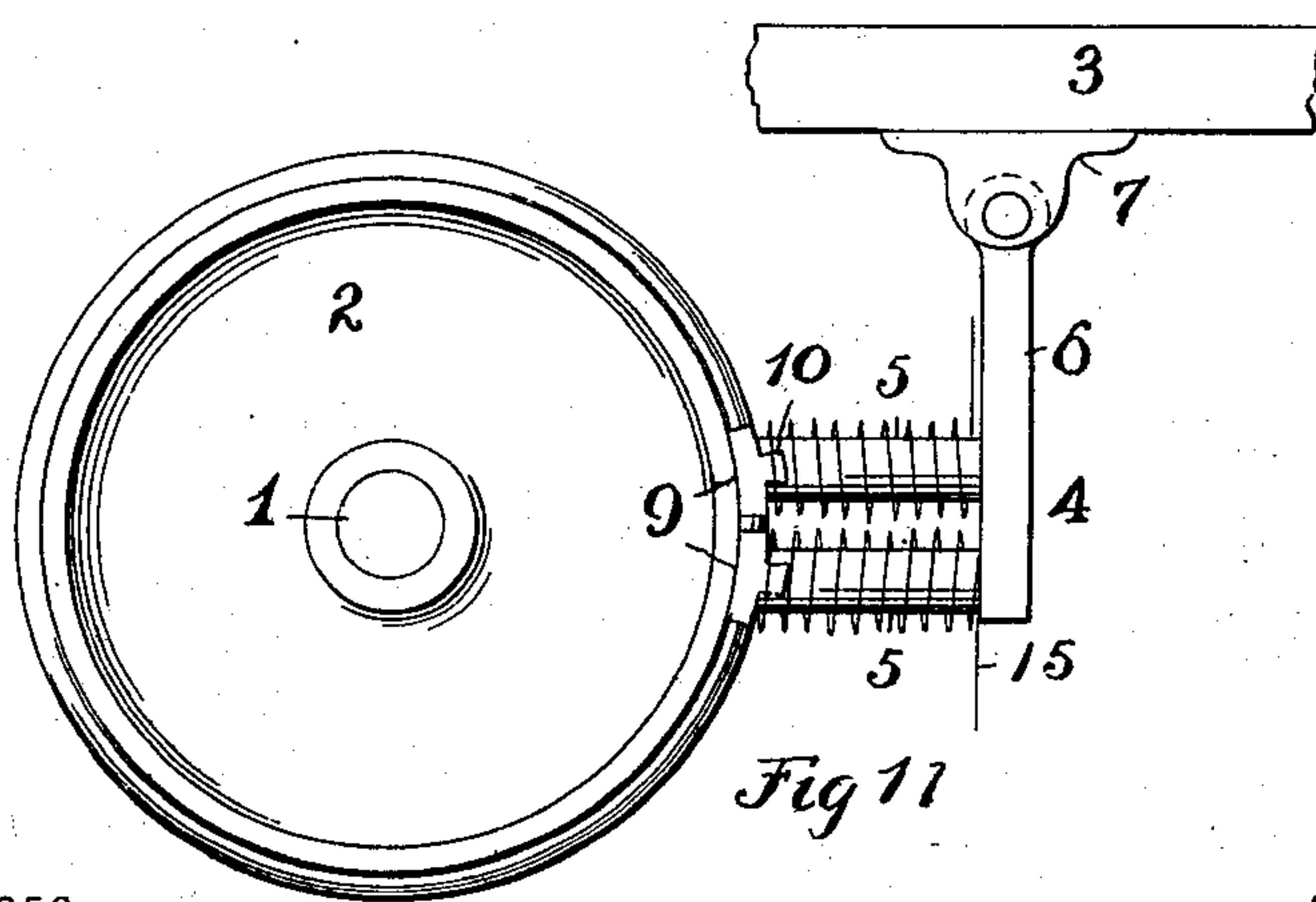
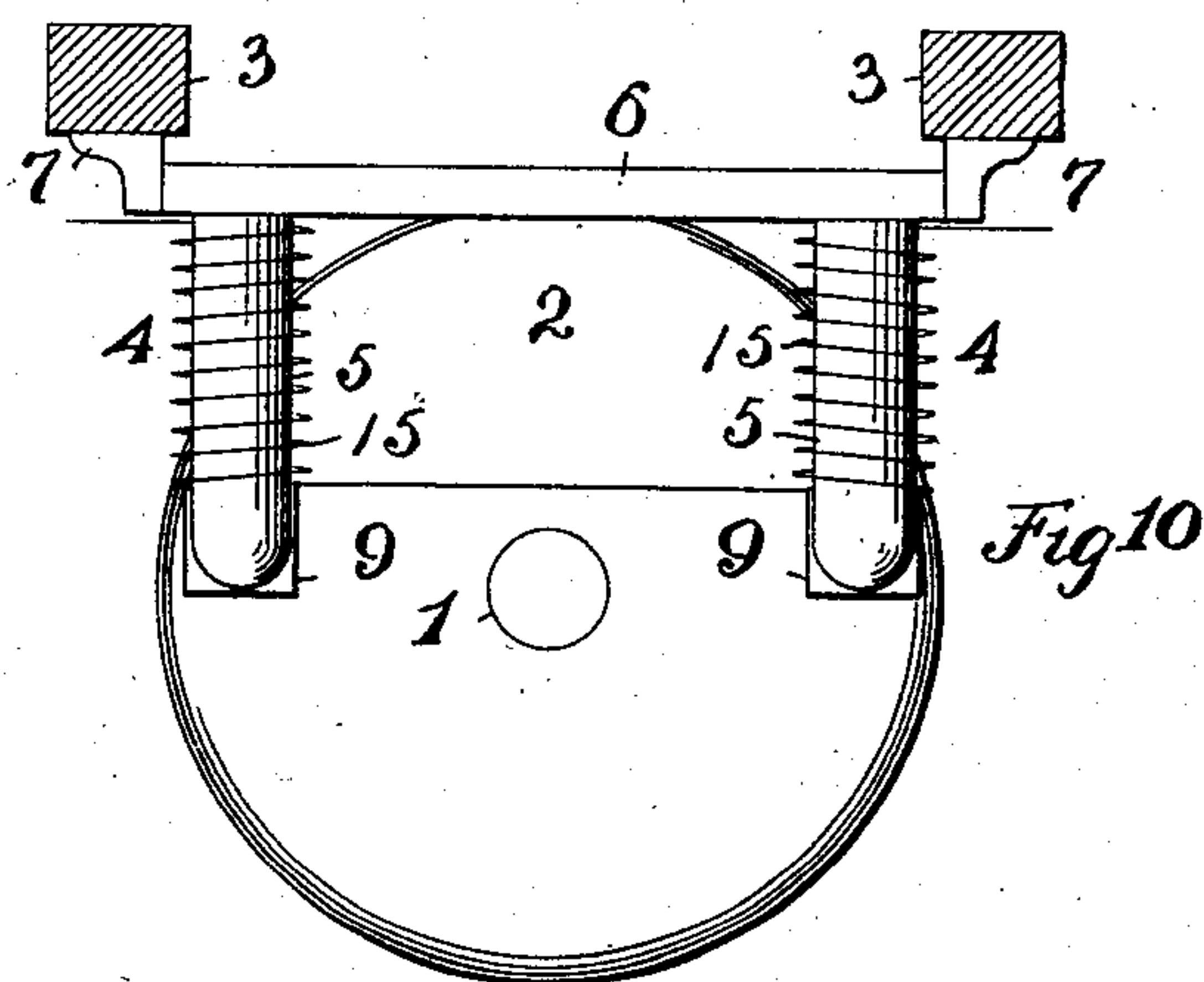
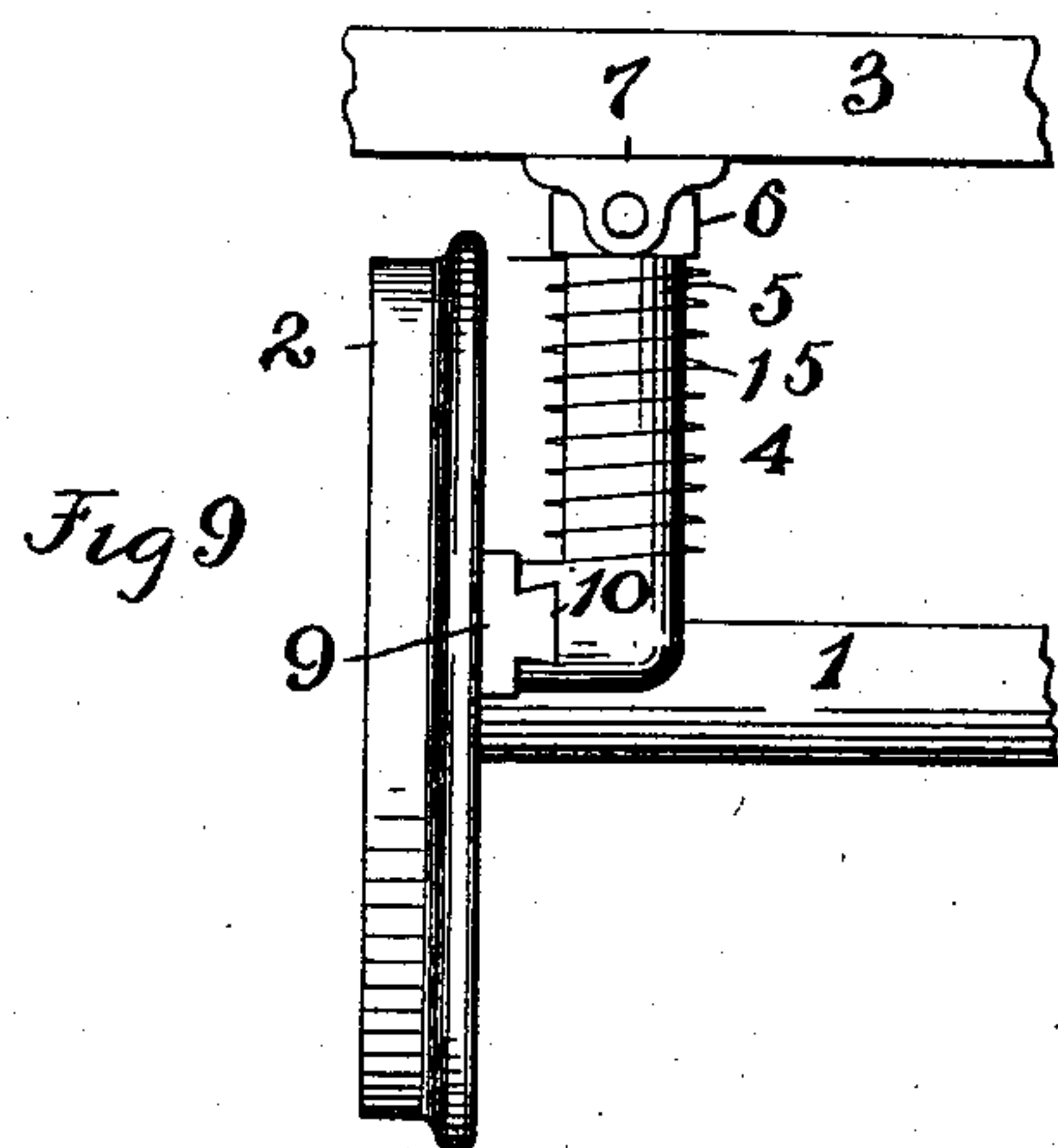
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UNITED STATES PATENT OFFICE.

JOHN S. LOCKWOOD, OF KANSAS CITY, MISSOURI.

ELECTROMAGNETIC BRAKE.

SPECIFICATION forming part of Letters Patent No. 750,207, dated January 19, 1904.

Application filed June 23, 1902. Serial No. 112,743. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. LOCKWOOD, a citizen of the United States of America, residing in Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Improvement in Electromagnetic Brakes, of which the following is a specification, reference being had therein to the accompanying drawings, forming a part thereof.

My invention relates to improvements in electromagnetic brakes.

The object of my invention is to provide an electromagnetic brake for vehicles—such as cars, automobiles, &c.—that is efficient in operation, durable, and in which the wearing parts are readily inserted or removed.

My invention consists in certain novel features of construction hereinafter fully described and claimed.

Referring to the drawings which illustrate my invention, Figure 1 is a rear elevation view of one form of my invention in which an intermediate armature is employed in connection with a drum secured to a rotatable axle. Fig. 2 is an elevation view from one side of the intermediate armature shown in Fig. 1. Fig. 3 is a view of the same, taken from the other side. Fig. 4 is a vertical section taken on the line *a b* of Fig. 1. Fig. 5 is an end elevation view of the form shown in Fig. 6. Fig. 6 is a rear elevation view of a form of my invention in which the intermediate armatures are not connected with each other. Fig. 7 is a form of my invention in which the intermediate armature is supported by the framework and the electromagnet is carried by the said armature. Fig. 8 is a side elevation view of a form similar to that shown in Fig. 7, the armature being supported by the ordinary brake-beam. Fig. 9 is another modification of my invention shown in end elevation, in which the pressure is brought against the inner side of the wheel. Fig. 10 is a rear elevation view of the same. Fig. 11 is an end elevation view of still another form of my invention, in which the pressure is applied to the rim of the wheel.

Similar numerals of reference indicate similar parts.

1 is the axle, 2 the wheel rotatable therewith, 3 the framework for supporting the

magnets and which may be the body of the car or the truck-framework.

4 indicates the electromagnets, which may be of the ordinary construction, consisting of two cores 5, connected by a yoke 6. In the forms shown in Figs. 1, 4, 5, 6, 9, 10, and 11 the yoke 6 is pivotally mounted in brackets 7, secured to the framework 3, thus permitting the magnets 4 to be swung, so as to energize the armature, which is rotatable with the wheel 2. The armature may either be the wheel itself, as shown in Figs. 7, 8, 9, 10, and 11, or it may be a drum 8, of magnetizable material, secured upon the axle 1, which in this case must be rotatable with the wheel to which it is secured.

9 indicates an intermediate armature insertible between the armature carried on the axle 1 and the magnet-cores 5 and preferably secured rigidly to the said cores. In the form shown in Figs. 1, 2, 3, 7, and 8 the intermediate armature 9 extends from one core to the other, and in the forms shown in Figs. 1, 4, 5, 6, 9, 10, and 11 the cores 5 are provided with transverse dovetail grooves in which a tongue 10 on the armature is fitted. The said grooves are preferably slightly tapered lengthwise, and the tongue on the intermediate armature is similarly tapered, thus providing a tight fit between the intermediate armature and the core. In the form shown in Fig. 7 and in the form of intermediate armature illustrated in Fig. 3 the intermediate armature is formed of three pieces, two magnetizable ends, and a central connecting portion of non-magnetizable material, such as brass. With this form of intermediate armature none of the magnetic strength is short-circuited by the intermediate armature, or at least the magnetic field is not so much diverted from the principal armature by the intermediate armature as in the forms shown in Fig. 1. In the forms shown in Figs. 5, 6, 9, 10, and 11 the intermediate armatures are two separate armatures in each instance, secured one to each pole 5 of the magnet.

In the forms of my invention provided with the intermediate armatures shown in Figs. 1, 4, 5, and 6 when the current is sent through the helix-wires 15 the cores 5 will become energized, thus magnetizing the magnetic drum

8 through the intermediate armature 9 and causing the magnets to swing on their pivotal supports, so as to cause the intermediate armature 9 to bear tightly against the drum 8 and tend to retard the rotation of the drum, together with axle 1. The intermediate armature 9 should not have in it sufficient iron to absorb too much magnetism from the drum, and it should be only thick enough to give a fair wearing-body. When the armature 9 is composed of three pieces, the center one being non-magnetic, it is immaterial how heavy the pieces are, as comparatively little of the magnetic force would be diverted from the rotating armature.

In the forms of my invention shown in Figs. 9, 10, and 11 when the helix-wires 15 are energized the magnet 4 will be drawn toward the car-wheel 2, which in this case is the rotating armature, and pressure will be applied to the wheel by the intermediate armatures 9, thus tending to retard the rotation of the wheel.

In the form of my invention shown in Fig. 7 the intermediate armature is pivoted to the bracket 7, which in turn is secured to the framework 3. The core 5 in this form is curved and has its ends secured rigidly to the armature 9. When the helix is energized, the magnetism of the core 5 will cause a pressure between the armature 9 and the wheel-rim. With this form of my invention the strain is removed from the magnet, which is supported by the armature 9. The magnet 4 of the form shown in Fig. 8 is similarly supported on the armature 9, the armature being mounted on the ordinary brake-beam 12. When the magnet is energized, the armature 9 will be forced against the wheel 2, thus tending to prevent its rotation.

My invention is capable of other modifications without departing from its spirit.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a magnetizable

drum, of a suitable support, an electromagnet movably mounted on said support and having two cores provided each with a groove, and an armature mounted in said grooves and adapted to bear upon said drum and comprising two magnetic portions and a third non-magnetic connecting portion, substantially as described.

2. The combination with a rotatable magnetizable body, of an electromagnet having two cores in the magnetic field of which the said body is located, and an armature detachably secured to both cores and located between the cores and the said body.

3. The combination with the wheel of a magnetizable body rotatable therewith, an electromagnet having two cores provided with a groove in each, and an armature extending from one core to the other and mounted in said grooves and disposed between the said body and the two cores.

4. The combination with the wheel, of a magnetizable body rotatable therewith, an electromagnet having two cores and movable toward and from the said body, and an armature extending from one core to the other and detachably connected with the two cores and disposed between the cores and the magnetizable body.

5. The combination with the wheel, of a magnetizable body rotatable therewith, an electromagnet having two cores and movable toward and from the said body, and an armature extending from one core to the other and detachably connected with the two cores and located between the cores and the said body, the armature comprising three portions the intermediate of which is non-magnetic.

In testimony whereof I have signed my name to this specification in presence of the two subscribing witnesses.

JOHN S. LOCKWOOD.

Witnesses:

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R. E. HAMILTON.